Amendment to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently amended) A method for identifying agents that modulate PP2A methylation, the method comprising steps of:

providing a plurality of candidate test agents;

assessing effects of individual candidate test agents on PP2A methylation status in a PP2A methylation assay that contains PP2A, a PP2A methylase enzyme, and a PP2A demethylase enzyme; and

identifying, ~~determining,~~ based on the assessed effects, one or more agents that modulate PP2A methylation~~that a particular candidate test agent modulates PP2A methylation status~~.

2-3. (Canceled)

4. (Currently amended) The method of claim 1~~claim 3~~, wherein the phosphorylated protein is tau.

5. (Previously presented) The method of claim 4, wherein tau is hyperphosphorylated, and wherein the test agent increases methylation of PP2A and decreases tau hyperphosphorylation.

6. (Currently amended) A method for identifying a composition that modulates PP2A methylation status, the method comprising steps of:

providing a composition;

assessing effects of the composition on PP2A methylation status in a PP2A methylation assay that contains PP2A, ~~PP2A and one or more of~~ a PP2A methylase enzyme, ~~enzyme~~ and a PP2A demethylase enzyme; and

determining, based on the assessed effects, that the composition modulates PP2A methylation status.

7. (Previously presented) The method of claim 6, wherein the composition is an extract of a natural product.

8. (Previously presented) The method of claim 6, wherein the composition is an extract of a traditional medicine.

9. (Canceled)

10. (Previously presented) The method of claim 17, wherein the phosphorylated protein is tau.

11. (Previously presented) The method of claim 17, wherein tau is hyperphosphorylated, and wherein the composition increases methylation of PP2A and decreases tau hyperphosphorylation.

12. (Withdrawn) A compound identified by the method of claim 1.

13. (Withdrawn) A composition identified by the method of claim 6.

14. (Withdrawn) A composition comprising a compound according to claim 12.

15. (Withdrawn) A method for treatment of cells to alter therein an activity of a protein, comprising administering to the cells by an effective route a compound of claim 12 in an amount effective to alter therein the activity of the protein.

16. (Withdrawn) A method for treatment of cells to alter therein an activity of a protein, comprising administering to the cells by an effective route a composition of claim 13 in an amount effective to alter therein the activity of the protein.

17. (Previously presented) The method of claim 1 or claim 3, wherein the PP2A methylation assay determines activity of a PP2A methylase enzyme or PP2A demethylase enzyme.

18-19. (Canceled)

20. (Currently amended) The method of claim ~~6 or claim 19~~, wherein the assessed effects comprise activity of the PP2A methylase enzyme.

21. (Currently amended) The method of claim 6 ~~or claim 19~~, wherein the assessed effects comprise activity of the PP2A demethylase enzyme.

22. (New) The method of claim 17, wherein the activity is binding to PP2A.

23. (New) The method of claim 20, wherein the activity is binding to PP2A.

24. (New) The method of claim 21, wherein the activity is binding to PP2A.

25. (New) The method of claim 1 or 6, wherein the test agent or the composition affects phosphatase activity of PP2A through its effects on PP2A methylation.

26. (New) The method of claim 1 or 6, wherein the test agent or the composition increases PP2A methylation.

27. (New) The method of claim 1 or 6, wherein the test agent or the composition activates the PP2A methylase enzyme.

28. (New) The method of claim 1 or 6, wherein the test agent or the composition activates the PP2A methylase enzyme, the PP2A demethylase enzyme, or both the PP2A methylase enzyme, the PP2A demethylase enzyme.

29. (New) The method of claim 28, wherein the test agent or the composition does not activate the PP2A demethylase enzyme.

30. (New) The method of claim 28, wherein the PP2A methylation status results from the overall effect of the test agent or the composition on the PP2A methylase enzyme and the PP2A demethylase enzyme.

31. (New) The method of claim 1 or 6, wherein the test agent or the composition inhibits the PP2A demethylase enzyme.

32. (New) The method of claim 1 or 6, wherein the test agent or the composition inhibits the PP2A methylase enzyme, the PP2A demethylase enzyme, or both the PP2A methylase enzyme, the PP2A demethylase enzyme.

33. (New) The method of claim 32, wherein the test agent or the composition does not inhibit the PP2A methylase enzyme.

34. (New) The method of claim 32, wherein the PP2A methylation status results from the overall effect of the test agent or the composition on the PP2A methylase enzyme and the PP2A demethylase enzyme.

35. (New) The method of claim 1 or 6, wherein at least one test agent or the composition is not already known to modulate PP2A methylation.

36. (New) The method of claim 1 or 6, wherein at least one test agent or the composition interferes with PP2A subunit assembly.

37. (New) The method of claim 36, wherein the test agent interferes with binding of the methylase, the demethylase enzyme, or both the methylase and the demethylase enzyme to PP2A.

38. (New) The method of claim 1 or 6, wherein one or more of the PP2A, the methylase enzyme, and the demethylase enzyme is purified.

39. (New) The method of claim 1 or 6, wherein one or more of the PP2A, the methylase enzyme, and the demethylase enzyme is provided in the form of a partially purified extract.

40. (New) The method of claim 1 or 6, wherein one or more of the PP2A, the methylase enzyme, and the demethylase enzyme is expressed in a cell.

41. (New) The method of claim 1 or 6, wherein one or more of the PP2A, the methylase enzyme, and the demethylase enzyme is provided in the form of a mouse that produces one or more of the PP2A, the methylase enzyme, and the demethylase enzyme.

42. (New) The method of claim 1 or 6, wherein one or more of the PP2A, the methylase enzyme, and the demethylase enzyme is provided in the form of a human that produces one or more of the PP2A, the methylase enzyme, and the demethylase enzyme.

43. (New) The method of claim 1 or 6, wherein the step of assessing comprises contacting the test agent or composition with cells that express one or more of the PP2A, the methylase enzyme, and the demethylase enzyme.

44. (New) The method of claim 43, wherein the step of contacting or administering is followed by a step of determining the methylation status of PP2A.

45. (New) The method of claim 44, wherein the methylation status refers to an increase in PP2A methylation.

46. (New) The method of claim 44, wherein the methylation status refers to a decrease in PP2A methylation.

47. (New) The method of claim 43, wherein the step of contacting or administering is followed by a step of determining the phosphorylation status of at least one substrate of PP2A.

48. (New) The method of claim 47, wherein the at least one substrate of PP2A is tau or MAP kinase.

49. (New) The method of claim 47, wherein the phosphorylation status refers to an increase in PP2A phosphorylation.

50. (New) The method of claim 47, wherein the phosphorylation status refers to a decrease in PP2A phosphorylation.

51. (New) The method of claim 1 or 6, wherein the step of assessing comprises administering the test agent or the composition to an organism that produces one or more of the PP2A, the methylase enzyme, and the demethylase enzyme.

52. (New) The method of claim 51, wherein the step of contacting or administering is followed by a step of determining the methylation status of PP2A.

53. (New) The method of claim 52, wherein the methylation status refers to an increase in PP2A methylation.

54. (New) The method of claim 52, wherein the methylation status refers to a decrease in PP2A methylation.

55. (New) The method of claim 51, wherein the step of contacting or administering is followed by a step of determining the phosphorylation status of at least one substrate of PP2A.

56. (New) The method of claim 55, wherein the at least one substrate of PP2A is tau or MAP kinase.

57. (New) The method of claim 55, wherein the phosphorylation status refers to an increase in PP2A phosphorylation.

58. (New) The method of claim 55, wherein the phosphorylation status refers to a decrease in PP2A phosphorylation.

59. (New) A method comprising steps of:

providing a plurality of test agents that modulate PP2A methylation status in a PP2A methylation assay that contains PP2A, a PP2A methylase enzyme, and a PP2A demethylase enzyme;

identifying at least one structural moiety whose presence correlates with modulation of PP2A methylation in the PP2A methylation assay;

providing at least one candidate test agent that also shares the structural moiety;

assessing effects of the at least one candidate test agent on PP2A methylation status in an assay that contains PP2A, a PP2A methylase enzyme, and a PP2A demethylase enzyme.